

EDEBOHLS (G. M.)

WITH COMPLIMENTS OF THE AUTHOR.

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## The Other Kidney in Contemplated Nephrectomy.

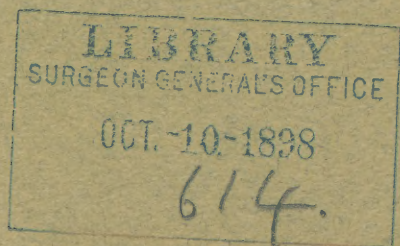
BY

GEORGE M. EDEBOHLS, A.M., M.D.,

PROFESSOR OF GYNECOLOGY, NEW YORK POST-GRADUATE MEDICAL SCHOOL;  
GYNECOLOGIST, ST. FRANCIS HOSPITAL; CONSULTING GYNECOLOGIST,  
ST. JOHN'S HOSPITAL.

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THE OTHER KIDNEY IN CONTEMPLATED  
NEPHRECTOMY.\*

BY

GEORGE M. EDEBOHLS, M.D.,  
NEW YORK.

When nephrectomy is either contemplated or becomes a possibility in the course of any operation contemplated, a knowledge of the presence and condition of the other kidney becomes of prime and dominating importance.

A number of cases are on record in which a kidney removed by nephrectomy proved, after the necessarily resultant death of the patient, to be the only kidney the patient had ever possessed.

The writer, in his operative work, has met with several cases of single kidney. In none of these patients, fortunately, was there any indication for nephrectomy.

The presence of two kidneys can usually be determined by palpation. Mistakes, however, are possible in this connection. An enlarged gall-bladder has frequently been mistaken for a right kidney. The writer has himself committed this mistake in a case presenting a movable, kidney-shaped tumor in the right lumbar region. An exploratory lumbar incision proved the tumor to be a distended gall-bladder. Further exploration, moreover, established the complete absence of a right kidney.

Palpation, while *generally* to be relied upon to determine the presence of the kidney, *just as generally fails* to give us exact and satisfactory information of the condition of a kidney. It is nearly, or quite, impossible by palpation alone to diagnosticate a case of nephritis, or to determine from which kidney a renal hemorrhage proceeds. A majority of cases of surgical kidney, multiple abscess of kidney, purulent nephropylitis and renal tuberculosis elude diagnosis by palpation alone. Many cases of tumor of the kidney, even, do not produce sufficient enlargement to be defined by palpation.

Visual inspection of the interior of the bladder and catheterization of the ureters give valuable aid in determining the presence and the condition of each kidney. Cystoscopy is a comparatively easy and, if aseptically carried out, safe procedure both in the male and female, and should always be employed as a preliminary in contemplated nephrectomy. The results of cysto-

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scopy, however, will not invariably prove completely satisfying. It may not always be possible to recognize distinctly *both* ureteral orifices. In that case a certain doubt must remain, first as to the presence of a second kidney, and secondly as to the character of its secretion, if present. Again, even if both ureteral orifices be distinctly seen, the result of watching them may prove misleading. Pus kidneys, especially cases of suppurative nephropylitis, may discharge their secretion into the bladder at very irregular intervals, and the result of inspection of the ureteral orifices, at any one or several times, may prove entirely negative. I have observed one instance in which an examination of the urine, made previous to operation, showed absolutely no albumen or pus; yet on operation I found and removed a kidney converted into a pus-sac twenty-three centimetres long and about eleven centimetres in diameter. In this particular case, indeed, occurring in the wife of a physician, pyuria had *at no time* been observed or even suspected. Even if we obtain pus from a kidney by ureteral catheterization we are still left completely in the dark, as to the location and extent of the disease: whether it be a purulent nephropylitis, for example, or an abscess or abscesses in the substance proper of the kidney.

In renal hæmaturia, likewise, the results of inspection of the ureteral orifices by cystoscopy may be misleading. It may be that only one ureteral orifices can be distinctly recognized. If bloody urine issue from that we cannot be sure that the other kidney is not also bleeding, or even that a second kidney is present. Or the confusing discovery may be made, as happened in one of my cases seen and verified by my friend Dr. Howard A. Kelley, and elsewhere reported,<sup>1</sup> that bloody urine comes at one time from one and at another time from the other kidney. In this case the hæmaturia proceeded from the left kidney on one day and from the right kidney on the next. It proved to be a case of malarial nephrorrhagia, was promptly cured by quinine, and has remained cured. And finally, cystoscopy, although it may locate the bleeding in one or the other kidney, can give us no information regarding the nature of the lesion causing the renal hæmaturia.

Our next resource in determining the presence and condition of a kidney consists in collecting the urine from each kidney separately by means of catheterization of the ureters. This, in the male, is a comparatively new and difficult procedure, not certain always to succeed even in the hands of experts. In females the procedure is more readily carried out and more certain of result, owing chiefly to the possibility of direct cystoscopy in women.

<sup>1</sup> New York Journ. Gyn. and Obst., July, 1894, page 36.

Catheterization of the uterers, however, has its shortcomings, drawbacks and contraindications, which unfortunately greatly impair the usefulness and efficiency of what would otherwise be a nearly ideal method of obtaining information relative to the condition of each kidney taken by itself. I say *nearly* ideal, because in pyuria of renal origin it indicates neither the extent nor the exact seat, nor the multiplicity or otherwise, of the suppurative process, and in renal hæmaturia it tells us nothing of the lesion causing the hæmorrhage. Nay, in renal hæmaturia we may even be unable to decide by catheterization of the uterers as to which kidney is bleeding, since catheterization of the ureters often (one writer states in 50% of cases) itself causes bleeding from the uterers.

An important contraindication to catheterization of the ureters obtains in the relatively large class of cases of pyuria, and is based upon the danger of carrying infection from the bladder into a healthy ureter by means of the ureteral catheter. The same danger obtains in cases of unilateral renal, or of vesical tuberculosis; a healthy ureter may be inoculated and the tuberculosis may ascend to a healthy kidney. This danger of infecting a healthy ureter and kidney is real and the responsibility for its risk must not be lightly assumed by any man.

Skiagraphy and the fluoroscope promise, in the near future, to enable us to learn much about the condition of the kidneys *intravitalm*. The presence and position of the kidney can be readily determined by the fluoroscope. In several cases in which I made the diagnosis of movable kidney by palpation, Dr. Samuel Lloyd has been able to verify the diagnosis by viewing the displaced kidneys with the fluoroscope, the patients, divested of part of their clothing, standing erect before him. Stones in the kidney have already been clearly skiagraphed, and it is quite possible that other lesions of the kidney, tumors, for instance, and even abscesses, will soon reveal to us their presence by means of the skiagraph and the fluoroscope. The difficulty, I imagine, will be to interpret correctly what we see with the fluoroscope and what the skiagraph pictures. Time, improvements in skiagraphy and the fluoroscope, and larger clinical experience, will no doubt solve many of these difficulties.

In the meanwhile there remains a final resource for determining the presence and the condition of the other kidney any allusion to which in surgical literature has thus far escaped the writer, although he has heard of its having been recently resorted to, at least in part, by a prominent New York surgeon. *I refer to incision down upon, delivery, and examination of the fellow of the kidney to be removed, previous to completing an otherwise*



*indicated nephrectomy.* On May 23, 1894, when I first practically carried out the idea, I believed the conception original with myself, and I have found no reason up to the present to change this belief. As any claim to priority which I may have is based upon this case, I take the liberty of quoting briefly from its published report: \*

"A portion of the right kidney, four inches in length, was now brought to the bottom of the wound. It so greatly resembled the distended large intestine that for a time we were in doubt about its identity. It was finally identified by rolling it around and stripping off the perirenal fat until the ureter and renal vessels were recognized. The kidney itself, after coaxing it out upon the back, measured twenty-three centimeters in length, and was converted into a thin sac moderately distended with fluid. It was returned into the body to await the result of an exploratory incision upon the left kidney. The left kidney was found enlarged but otherwise healthy, evidently doing, and able to do, the work of both. It was anchored in the way described by the writer (*American Journal of the Medical Sciences*, March and April, 1893), and the left wound closed. Returning now to the right kidney, this organ, evidently degenerated beyond the possibility of repair, was removed without spilling a drop of its contents, the renal artery and vein, and the ureter being separately tied with silk. Iodoform gauze tamponade of wound. On examination after removal the right kidney was found distended into a huge sausage shaped sac, the walls of which were everywhere as thin as the walls of the renal pelvis. This sac was filled with purulent urine having a decided ammoniacal odor."

Since the above case the writer has applied the method advocated in two additional cases, and has had occasion, in one further case, to regret his failure to apply it. The two cases in which it was applied were cases of nephrectomy for renal hæmaturia, in which the hæmorrhage, by its copiousness in one and its long continuance in the other patient, threatened life, and in both of which all known measures to control the bleeding had been tried and had failed. In both of these cases, after exposure, delivery and examination of the bleeding kidney, and before its removal, the opposite kidney was also exposed by incision, delivered, examined, and found to be healthy and not bleeding. In these cases the exploration of both kidneys, the nephrectomy, and closure of both wounds for primary union (which was obtained in all four wounds) required sixty and seventy minutes respectively.

The instance in which the writer had occasion to regret a nephrectomy performed without such exploration of the other kidney was in a case of surgical kidney. The patient was in a very feeble and precarious condition, and the enlarged right kidney, riddled with innumerable abscesses of all sizes, was hurriedly removed without exploration of the left kidney. On the death of the patient, two days after operation, the left kidney was found to be as badly disorganized by multiple abscesses as was the right. The result would, of course, have been the same as far as the

\* Edebohls, Notes on Movable Kidney and Nephrorrhaphy, Part III, *American Journal of Obstetrics*, February, 1895.



patient's life was concerned, still the nephrectomy was unnecessary, and would not have been performed had I known the condition of the other kidney.

Modern surgery, with improvements in methods, technics and appliances, has made exploratory incision, eventration, and examination of the kidney a perfectly safe procedure, and one that can be expeditiously carried out. At a time when more ancient methods prevailed, when it was necessary to change the position of the patient and sterilize a new skin area before the other kidney could be approached, when it was an arduous task to deliver the kidney through the incision, when the incision itself was generally a complicated and serious matter, with additional incisions at right and oblique angles to widen the portal of approach, when the wound was usually packed and left to the slow and exhausting process of healing by granulation, the whole procedure was indeed a formidable affair, necessarily consumed a great deal of time, and imperiled the patient's chances of recovery.

With modern methods, presently to be outlined, exposure by incision, delivery and examination of both kidneys, with nephrectomy on one side and closure of both wounds for primary union, need occupy no longer than sixty to seventy-five minutes, according to the difficulty of the particular case. With larger experience this time-allowance will, in all probability, be considerably reduced.

Previous to October, 1892, the date of the writer's first bilateral nephropexy, operation upon both kidneys *at the same sitting* were extremely rare, the only recorded instance which I have been able to find being a bilateral nephropexy performed by Küster in 1883. Within the past five or six years, on the other hand, bilateral nephropexy at the same sitting has become exceedingly common, the writer personally having performed it no less than twenty-one times.

The following is the author's present method of procedure in contemplated nephrectomy :

1. Place the patient prone upon the table, and cleanse the entire width of the back in the lumbar region so as to be ready to cut down upon both kidneys without the necessity of redisinfection or change of position.
2. Place the author's kidney air-cushion transversely across the table, underlying and supporting the patient's abdomen.
3. Incise along the outer border of the erector spinæ muscle, the incision extending in a straight line from lower border of last rib to crest of ilium. Should the space between rib and ilium be unusually narrow, the incision is made a little more oblique, so

that its lower end will reach the ilium a little outside of the lateral border of the erector spinæ. In no case should additional incisions, at right or oblique angles to the first, with possibly resection of a rib, as still so frequently practised by many surgeons, be made. The *absolute* necessity for such additions to the simple straight incision must be extremely rare. The writer has not encountered it once in nearly 150 lumbar incisions made for nephropexy, nephrotomy, nephrectomy, and exploration of the kidney; all of his kidney work has been done through the simple straight incision. As the large incision is held to be justified by those who make it on the score of its necessity for examination and delivery of the kidney, I may add to the above statement that in at least 120 of my cases was the kidney completely delivered through the incision.

4. Continue the first incision through the muscles and fascia of the abdominal parietes until the perirenal fat is reached. In cutting through the abdominal wall avoid injuring the large ilio-gluteal nerve. Its division is followed by post operative pains and dysæsthesiæ in the upper and outer part of the gluteal region, of which patients complain bitterly, often for months after operation. The intact nerve can generally be hooked either outward or inward during delivery of the kidney. In three cases in which the nerve ran directly across the middle of the incision, and it was impossible to deliver the kidney either above or below the nerve, I have divided the latter, and, after returning the kidney, reunited the divided ends of the nerve by suture. In none of these three cases did the patients complain of the characteristic pain following solution of continuity of the ilio-gluteal nerve.

5. Cut through the perirenal fat until the kidney is reached. Separate the kidney sufficiently from its connective tissue connections to permit of its delivery.

6. Deliver the kidney through the lumbar incision. In case the kidney be distended with urine or pus, first draw off the fluid by aspiration to diminish bulk. At first I often experienced difficulty in delivering the kidney, until some years ago I hit upon the following method. With it delivery of the kidney, in nearly every instance, becomes a charmingly simple affair. An assistant, standing at the foot of the table, grasps the lower limbs of the patient and draws the patient towards him. In doing so the patient rolls along on the kidney cushion until the latter, instead of compressing the abdomen, comes to lie underneath the anterior surface of the lower half of the thorax. Compression of this portion of the thorax squeezes the kidney out from beneath the ribs, causing it to present fully in the wound. With a little more or less assistance on the part of the operator, sometimes, indeed, without



any assistance whatsoever, except the above manœuvre, complete delivery of the kidney is effected.

In the two instances of renal hæmorrhage above related I laid both kidneys simultaneously side by side upon the skin of the back for more careful comparative study.

7. Palpation of every part of the kidney, of its pelvis, and of a greater or less length of ureter can now be performed. If indicated, any of the necessary operations upon the kidney, puncture, nephrotomy, exploratory or therapeutic, nephrolithotomy, resection of the kidney, etc., can be carried out. If a conservative operation be performed upon the kidney, exploration of the other kidney is not called for. Nephrectomy is easily performed by tying the renal vessels and ureter separately with forty-day catgut and cutting the kidney away.

8. After completion of examination or of operation, except nephrectomy, the kidney is returned within the abdomen. If a healthy kidney have been found movable prior to operation, nephropexy should be performed. Unless drainage of the interior of the kidney be called for, or the wound surfaces have been soiled by infectious matter, full closure of the lumbar incision for primary union, without drainage, should be the rule. This rule holds good for both incisions, the nephrectomy as well as the exploratory. The writer closes the deep layers of the wound, the abdominal parietes proper, with buried sutures of forty-day catgut, and the skin with the subcuticular suture.

The patient is out of bed by the tenth day, even after nephrectomy. The danger of hernia in this region, with the above form of incision, is practically *nil*. The writer has never seen a hernia in this region in his own practice, and the only case he knows of is one reported by Boldt as following a nephropexy.

For ascertaining the condition of a kidney, as well as obtaining assurance of its presence, lumbar exploratory incision possesses advantages, in positiveness and exactitude of resultant information, over examination of the urine, palpation of the kidney, cystoscopy, ureteral catheterization, skiagraphy, and the fluoroscope, while its risks and drawbacks, under modern methods, are scarcely greater than those of catheterization of the ureters. This holds especially true in pus and tuberculosis cases, and when catheterization of the ureters has to be repeated, perhaps several times.

The information gleaned from inspection, palpation, puncture, and, if need be, exploratory incision of a kidney lying before you upon the back generally leaves very little to be guessed at. Slight or beginning inflammatory changes are the most difficult to recognize, while the more advanced stages of nephritis are easily

determined by palpation and inspection. Traumatism of the kidney at once declare themselves. Aspiration will demonstrate the character of fluid collections in the pelvis or in the substance of the kidney. The appearance and feel of a surgical kidney are characteristic; if need be, an exploratory puncture will show the presence of pus. Stone in the pelvis or the calyces of the kidney can be readily recognized when the whole kidney can be grasped between the examining fingers; in case of doubt, a probatory puncture or even incision upon the suspected part is justifiable. Tumors of the kidney can be both seen and felt, and tuberculosis is easily recognized by the characteristic changes. A bleeding kidney, in addition to the spots of ecchymosis visible on the surface of the kidney, presents the tell tale, deep purple color of the renal pelvis. This optical phenomenon, which I have nowhere found described, is due to the presence of blood within the whitish-colored walls of the renal pelvis. It can be made to disappear temporarily by squeezing the blood out of the pelvis back towards the kidney.

**SUMMARY.**—Before extirpating a kidney, a knowledge of the presence and condition of the other kidney becomes of paramount importance.

The aids to obtaining such knowledge are: examining of the urine; palpation of the kidney; cystoscopy; catheterization of the ureters; skiagraphy; the fluoroscope; and finally exploratory incision.

The presence of a second kidney is determinable by most of these aids.

None of these aids, however, with the exception of the last mentioned, can, in all cases, give us completely satisfying information regarding the exact condition of the other kidney.

In cases of pyuria and tuberculosis of vesical or unilateral renal origin, catheterization of the ureters involves the risk of infection of a previously healthy ureter and kidney, and should be avoided.

Incision down upon, delivery, and examination of both kidneys (lumbar exploratory incision), as originally proposed and carried out by the writer, should be the rule in every contemplated nephrectomy in which we are not absolutely and beyond peradventure certain of the presence and exact condition of the other kidney.

Modern surgery, with improved methods and technics, has rendered lumbar exploratory incision a safe and expeditious procedure, the most, and generally the only, reliable one for determining the exact condition of the other kidney.





